

UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
WASHINGTON, D.C. 20591

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In the matter of the petition of
SIERRA INDUSTRIES, INC.
for an exemption from Sections 91.9(a)
and 91.531(a)(1) and (2) of the
Federal Aviation Regulations
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* Regulatory Docket
* No. 26734
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GRANT OF EXEMPTION

By letters dated December 18, 1991, and January 21, 1992, Mr. Mark Shannon, Shannon Engineering, Inc., 7675 Perimeter Road South, Suite 200, Seattle, Washington 98108, petitioned on behalf of Sierra Industries, Inc. (Sierra), for an exemption from Sections 91.9(a) and 91.531(a)(1) and (2) of the Federal Aviation Regulations (FAR). In addition, Mr. Shannon submitted a single-pilot annual training syllabus for the Cessna Citation 500 on April 21, 1992. A grant of exemption would permit Sierra and the operators of its Cessna Citation 500 models (for Serial Nos. 0001 through 0349 only) that are equipped with STC No. SA8176SW and either STC Nos. SA2172NM or SA645NW to be operated by one pilot without a second-in-command (SIC).

The petitioner requires relief from the following regulations:

Section 91.9(a) provides, in pertinent part, that no person may operate a civil aircraft without compliance with the operating limitations for that aircraft prescribed by the certificating authority of the country of registry.

Section 91.531(a)(1) provides, in pertinent part, that no person may operate a large airplane (more than 12,500 pounds, maximum certificated takeoff weight), without a pilot who is designated as a second-in-command.

Section 91.531(a)(2) provides, in pertinent part, that no person may operate a turbojet-powered multiengine airplane for which two pilots are required by the airplane's type certification requirements, without a pilot who is designated as a second-in-command.

The petitioner supports its request with the following information:

The petitioner states that it is a modification center for the Cessna Citation airplanes (for Serial Nos. 0001 through 0349 only) and holds three STC authorizations for that airplane. It states that the three STC authorizations (STC Nos. SA2172NM, SA645NW, and SA8176SW) do not involve a change to any of the airplanes' systems or degrade the slow speed handling qualities. Sierra states that it is convinced that a grant of exemption on its petition will not compromise safety and will be in the public interest.

Sierra's petition references information from Cessna Aircraft Company's exemption to illustrate how a grant of exemption would not compromise safety. Sierra cites the FAA's determination that in light of the past operating experience of Citation airplanes certified under Part 23, an exemption with appropriate conditions and limitations, would not have an adverse effect on safety in operations using the Citation airplanes certified under Part 25."

Sierra states that a grant of exemption would be in the public interest, because allowing the Citation 500 to operate with only one pilot would result in substantial economic benefits to the operator. These airplanes would remain economically competitive with the new airplanes. Sierra refers to a quote in Cessna Aircraft Company's grant of exemption, in which the FAA stated that a grant of exemption would serve the public interest by providing operators with increased operating flexibility and reduced economic burdens.

The petitioner states that the only difference between the Cessna Citation 500 model and the 501 model is the aircraft's type certificate. The Cessna Citation 500 model is type certificated under Part 25 and the Cessna Citation 501 model is certificated under Part 23.

Sierra states that if it is issued a grant of exemption, the following equipment will be installed and operational on its aircraft:

1. JT15D-1A engines (or 1A by Sierra Industries STC SA8176SW).
2. Autopilot with approach coupling.
3. Flight director system.
4. Boom microphone.
5. Transponder ident switch on pilot's control wheel.

6. Sierra STC SA2172NM or Sierra STC SA645NW.

The FAA has determined that for the reasons stated by the petitioner, good cause exists for waiving the requirements for publishing a summary of this petition in the Federal Register.

The FAA's analysis/summary is as follows:

The FAA has reviewed and compared the petitioner's supporting information to that of other previously issued exemptions on this subject matter. The FAA has determined that Sierra's petition is similar to those previously issued exemptions and a grant of exemption with the conditions and limitations contained herein, would be equivalent to that provided by the rules.

The FAA has stated in past grants of exemption on this issue that the Cessna Citation 500 model is unique in that its initial design concept envisioned operations with a single pilot. To date, the Cessna Citation is the only turbojet airplane that has evolved into single-pilot operations. The FAA has stated that it agrees with Cessna Aircraft Company's statement that both the Part 23 certificated Cessna Citation and the Part 25 certificated Cessna Citation are identical from an operational standpoint.

When the original grant of exemption was issued to Cessna Aircraft Company on June 27, 1984, Cessna Aircraft Company provided information that showed that single pilot operations in the Part 23 certificated Cessna Citation constituted 22 percent of the eligible single pilot flight and flight hours. The FAA has previously stated that, "in view of the past operating experience of Cessna Citation airplanes certificated under Part 23, an exemption with appropriate conditions and limitations attached would not have an adverse effect on safety in operations using the Cessna Citation airplane certificated under Part 25."

In granting exemptions to the other petitioners from Sections 91.9(a) and 91.531(a)(1) and (2), the FAA has stated that it believes this grant of exemption will serve the public interest by providing operators with increased operating flexibility and reduced economic burdens. It also has provided the FAA with data that is being used to help assess the need for rulemaking.

Since the original grant of exemption to Cessna Aircraft Company in 1984, Cessna has been providing factual and analytical data concerning single-pilot operations conducted with respect to operational exposure, accident/incident data, and any known problem areas. Cessna's most recent petition for extension included the following cumulative data which covers the time period from October 1984 to December 1990:

- (1) There have been no reports of accidents involving single pilot operations under Exemption No. 4050, as amended.
- (2) Pilots describe operations under Exemption No. 4050 as normal kinds of Part 91 passenger-carrying IFR route profiles, which include operations to and from terminal-control areas and high density-traffic areas.
- (3) Pilots have reported a total of approximately 32,000 flight hours and 30,000 landings. Of these totals, 13,836 flight hours and 11,344 landings have been conducted with one pilot in the cockpit.
- (4) Single-pilot, type certificated CE-501 and 551 airplanes have logged 492,563 and 154,360 hours respectively. Although not confirmed by actual operator surveys, flight log reports at Cessna's data center indicate that single pilots flew 33 percent of these hours.
- (5) Cessna 552 (NAVY T-47) airplanes have accumulated 90,560 hours of single pilot operations all of which, have been accident-free flying.
- (6) Since the inception of the single pilot CE-501 airplane in 1977 through December 1990, Cessna's records show a total flight log history, for the Cessna 501's and 551's of having accumulated 1,142,430 flight hours. The flight logs reveal that single pilot crews flew approximately 381,000 hours.

In light of this excellent safety operating record with the Cessna Citation 500 series airplanes in single pilot operations and the petitioner's compliance with the conditions and limitations contained herein, the FAA has determined that this grant of exemption should maintain an equivalent level of safety as that afforded by the rules.

In consideration of the foregoing, I find that a grant of exemption is in the public interest. Therefore, pursuant to the authority contained in Sections 313(a) and 601(c) of the Federal Aviation Act of 1958, delegated to me by the Administrator (14 CFR 11.53), Sierra Industries, Inc. and the operators of Cessna Citation 500 models (for Serial Nos. 0001 through 0349 only) that are equipped with STC No. SA8176SW and either STC Nos. SA2172NM or SA645NW are granted an exemption from Sections 91.9 and 91.531 of the Federal Aviation Regulations to the extent necessary to allow the operation of these airplanes by one pilot without an SIC, subject to the following conditions and limitations:

1. This exemption does not become effective until Sierra receives approval from the FAA's General Aviation and Commercial Division, AFS-800, 800 Independence Avenue SW,

Washington, DC 20591 of its single pilot training program.

2. This exemption does not apply to operations conducted under Part 135 of the FAR.
3. Each pilot conducting single-pilot operations shall -
 - a. Complete a single-pilot training program approved by the FAA's General Aviation and Commercial Division, AFS-800, 800 Independence Avenue SW, Washington, DC 20591. Applicants for single-pilot authorization who complete the Sierra/FAA-approved single-pilot training program in accordance with this exemption will be valid for 12 calendar months from the month of completion of that program.
 - b. Hold a current Class II airman medical certificate.
 - c. Hold a commercial pilot certificate with an airplane instrument rating and Cessna 500 type rating.
 - d. Have logged at least 1,000 hours total pilot flight time, including at least 50 hours flight time at night, 75 hours instrument flight time, 40 hours of instrument flight time in actual instrument meteorological conditions, and 500 hours as a pilot in command or copilot of turbojet airplanes.
 - e. Not perform any circling instrument approaches to minimums of less than 200 feet and 1 mile above the published minimums, until completion of at least 100 hours of single-pilot flight experience in Cessna 500 series airplane.
 - f. Not perform any straight-in instrument approaches to minimums of less than 100 feet and 1/2 mile above the published minimums, until completion of at least 100 hours of single-pilot flight experience in Cessna 500 series airplane.
 - g. Use a boom microphone.
 - h. Have a fully functioning autopilot, controllable about three axes and capable of approach coupling. In the absence of a fully functioning autopilot, a minimum crew of two pilots is required.
4. The initial and recurrent single-pilot qualification training program must include the following:
 - a. Ground Instruction.
 - i. The maneuvers/procedures, as specified in Appendix A of Part 61.

- ii. High altitude aerodynamic and special flight characteristics.

- b. Flight/Simulator Instruction

- i. The maneuvers/procedures, as specified in Appendix A of Part 61.

- ii. The training must include an IFR route segment with operations at an altitude that is at least 80 percent of the maximum certificated altitude and with landings at two different points, taking into consideration takeoff and landing performance requirements.

NOTE: The flight/simulator instruction may be completed inflight in the airplane, or may be completed entirely in an approved simulator provided the simulator meets at least the minimum performance standards of a Phase II simulator and the applicant has performed three takeoffs and landings to a full stop as the sole manipulator of the flight controls in the Cessna 500 make and model airplane (for Serial Nos. 0001 through 0349 that are equipped with STC No. SA8176SW and either STC Nos. SA2172NM or SA645NW) within the preceding 90 days. In addition, the applicant must operate as a single pilot under the supervision of an instructor who has been qualified in accordance with Sierra's FAA-approved training program.

5. An applicant seeking initial single-pilot authorization, in accordance with the provisions of this exemption, must accomplish the following:

- a. Satisfactorily complete the training requirements as specified in the Sierra/FAA-approved training course.

- b. Satisfactorily accomplish the entire practical test inflight in the specific Cessna 500 series make and model airplane.

- c. Satisfactorily accomplish the final practical test within 10 days after the training has been completed. The final practical test must be conducted by an appropriately rated FAA-designated pilot examiner or an appropriately qualified FAA inspector, who is authorized to give such examinations in Cessna 500 series airplanes.

- d. Comply with the practical test requirements and standards in accordance with Appendix A of part 61, appropriate to the grade and class of pilot certificate and type rating the applicant holds.

- e. Satisfactorily perform all maneuvers and procedures throughout the entire practical test as a single pilot.
6. An applicant seeking recurrent single-pilot authorization in the Cessna 500 make and model airplane (for Serial Nos. 0001 through 0349 that are equipped with STC No. SA8176SW and either STC Nos. SA2172NM or SA645NW), under the provisions of this exemption, must accomplish the following:
- a. Satisfactorily complete the training requirements as specified in the Sierra/FAA-approved training course.
 - b. Satisfactorily accomplish the entire practical test inflight in the Cessna 500 series make and model airplane (for Serial Nos. 0001 through 0349 that are equipped with STC No. SA8176SW and either STC Nos. SA2172NM or SA645NW), or in an approved simulator provided the simulator meets at least the minimum performance standards of a Phase II simulator and the applicant has performed three takeoffs and landings to a full stop as the sole manipulator of the flight controls in the specific Cessna 500 series make and model airplane (for Serial Nos. 0001 through 0349 that are equipped with STC No. SA8176SW and either STC Nos. SA2172NM or SA645NW) within the preceding 90 days.
 - c. Satisfactorily accomplish the final practical test within 10 days after the training has been completed. The final practical test must be conducted by an appropriately rated FAA-designated pilot examiner or an FAA inspector who is qualified to conduct tests in Cessna 500 series airplanes.
 - d. Comply with the practical test requirements and standards in accordance with Appendix A of Part 61, appropriate to the grade and class of pilot certificate and type rating the applicant holds.
 - e. Satisfactorily perform all maneuvers and procedures throughout the entire practical test as a single pilot.
7. Sierra shall provide each person who is authorized to operate under the provisions of this exemption with a copy of this exemption.
8. Each operator shall carry a copy of this exemption on board each aircraft when operating under the provisions of the exemption.
9. No operator may transfer the provisions of this exemption when or if ownership or lease of the airplane is relinquished.
10. On September 1, 1993, and September 1, 1994, Sierra will

provide the FAA's General Aviation and Commercial Division, AFS-800, 800 Independence Avenue SW, Washington, DC 20591, with an analysis of operations conducted under this exemption with respect to operational exposure, accident/incident data, and any known problem areas.

11. Sierra will maintain the following records and make them available to the Administrator upon request:
 - a. The name, address, date of training enrollment and completion of each applicant who enrolls in its training course.
 - b. The date and location where the flight check was conducted, including the name of the FAA-designated examiner or FAA inspector conducting the check.
 - c. The number of flight hours and the purpose of the flights (i.e., passenger-carrying, ferry flights, cargo, maintenance) conducted as a single-pilot operations during the 12-month period preceding each single-pilot requalification.
 - d. The names of those applicants who require more flight training to pass the initial or recurrent flight check than that prescribed in the Sierra/FAA-approved training course. In addition, Sierra will provide information on the amount of additional training hours required to pass the flight check.
 - e. A list of those pilots who failed to complete the training program satisfactorily, and also those pilots who withdrew from the program and the reasons for the withdrawal.
 - f. The name and address of each person who is authorized to operate under this exemption.
12. A person who has previously received single-pilot authorization in a Cessna Citation 500 series airplane must satisfactorily complete the Sierra/FAA-approved training in order to obtain single-pilot authorization in the Cessna Citation 500 model airplane (for Serial Nos. 0001 through 0349 that are equipped with STC No. SA8176SW and either STC Nos. SA2172NM or SA645NW).
13. A person requesting single-pilot authorization must satisfactorily complete both ground and simulator training in accordance with the Sierra/FAA-approved training program and on the differences between the model represented by the simulator in which training is received and the Cessna Citation 500 model airplane (for Serial Nos. 0001 through 0349 that are equipped with STC No. SA8176SW and either STC Nos. SA2172NM or SA645NW) for which single-pilot

authorization is requested.

14. All Cessna 500 series airplanes (Serial Nos. 0001 through 0349 only) permitted to be used under the terms of this grant of exemption shall have the following equipment installed and operational:

1. JT15D-1A engines (or 1A by Sierra Industries STC SA8176SW).
2. Autopilot with approach coupling.
3. Flight director system.
4. Boom microphone.
5. Transponder ident switch on pilot's control wheel.
6. Sierra STC SA2172NM or Sierra STC SA645NW.

This exemption expires on September 30, 1994, unless sooner superseded or rescinded.

/s/ William J. White
Acting Director, Flight Standards Service

Issued in Washington, D.C. on September 9, 1992.